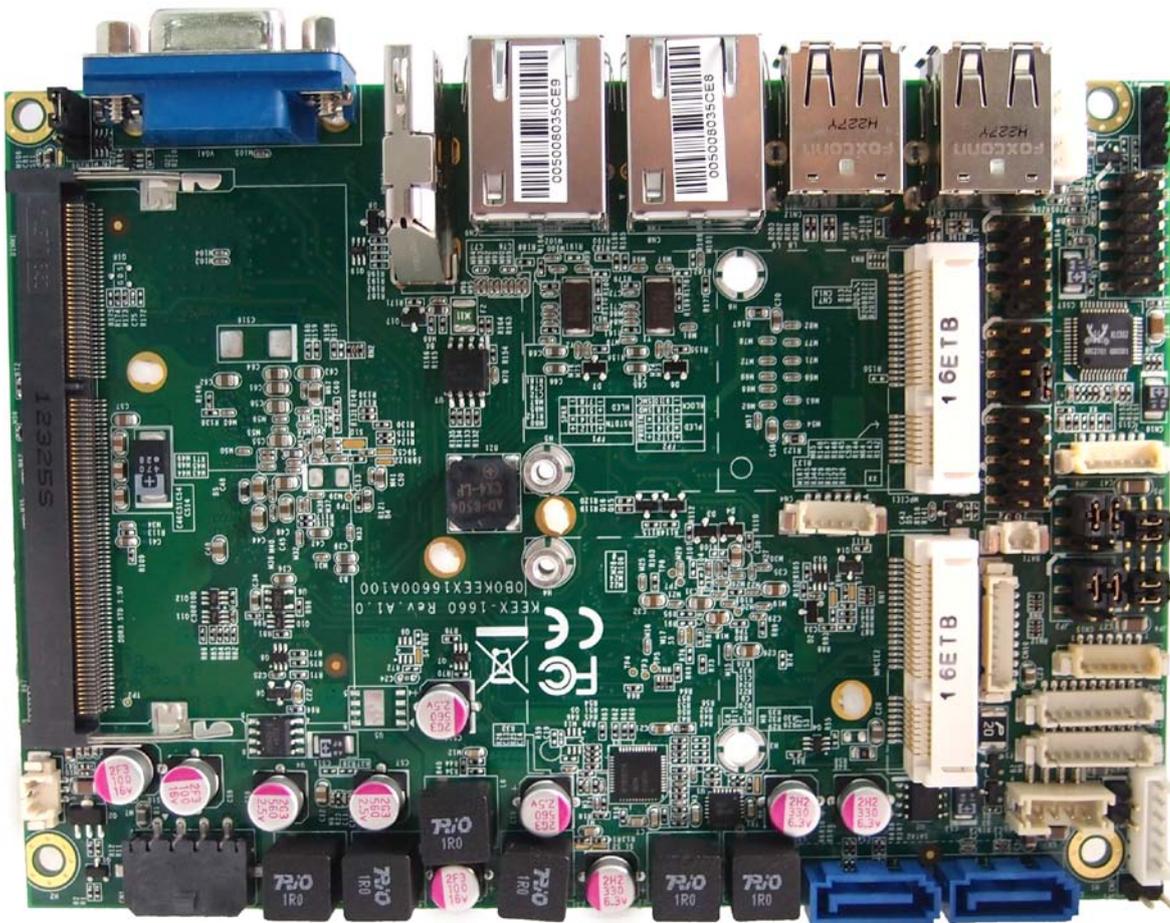


KEEX-1660

Industrial Embedded SBC with Intel® Atom™ Processor D2550

User's Guide



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Quanmax reserves the right to make changes without notice in product or component design as warranted by evolution in user needs or progress in engineering or manufacturing technology.

Changes which affect the operation of the unit will be documented in the next revision of this user's guide.

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Safety Instructions

■ Before You Begin

Before handling the product, read the instructions and safety guidelines on the following pages to prevent damage to the product and to ensure your own personal safety. Refer to the “Advisories” section in the Preface for advisory conventions used in this user’s guide, including the distinction between Warnings, Cautions, Important Notes, and Notes.

- Always use caution when handling/operating a computer. Only qualified, experienced, authorized electronics service personnel should access the interior of a computer. The power supplies produce high voltages and energy hazards, which can cause bodily harm.
- Use extreme caution when installing or removing components. Refer to the installation instructions in this user’s guide for precautions and procedures. If you have any questions, please contact Quanmax Post-Sales Technical Support.

WARNING



High voltages are present inside the chassis when the unit’s power cord is plugged into an electrical outlet. Turn off system power, turn off the power supply, and then disconnect the power cord from its source before removing the chassis cover. Turning off the system power switch does not remove power to components.

■ When Working Inside a Computer

Before taking covers off a computer, perform the following steps:

1. Turn off the computer and any peripherals.
2. Disconnect the computer and peripherals from their power sources or subsystems to prevent electric shock or system board damage. This does not apply when hot swapping parts.

3. Follow the guidelines provided in “Preventing Electrostatic Discharge” on the following page.
4. Disconnect any telephone or telecommunications lines from the computer.

In addition, take note of these safety guidelines when appropriate:

- To help avoid possible damage to system boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.
- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.

CAUTION



Do not attempt to service the system yourself except as explained in this user's guide. Follow installation and troubleshooting instructions closely.

■ Preventing Electrostatic Discharge

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedure to reduce the risk of damage to components. Quanmax strongly encourages you to follow proper ESD procedure, which can include wrist straps and smocks, when servicing equipment.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component's antistatic packing material until you are ready to install the component in a computer. Just before unwrapping the antistatic packaging, be sure you are at an ESD workstation or grounded. This will discharge any static electricity that may have built up in your body.

Safety Instructions

- When transporting a sensitive component, first place it in an antistatic container or packaging.
- Handle all sensitive components at an ESD workstation. If possible, use antistatic floor pads and workbench pads.
- Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.
- Do not handle or store system boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.

Preface

■ How to Use This Guide

This guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and upgrades.

NOTE



Driver downloads and additional information are available under Downloads on our web site: www.quanmax.com.

■ Unpacking

When unpacking, follow these steps:

1. After opening the box, save it and the packing material for possible future shipment.
2. Remove all items from the box. If any items listed on the purchase order are missing, notify Quanmax customer service immediately.
3. Inspect the product for damage. If there is damage, notify Quanmax customer service immediately. Refer to “Warranty Policy” for the return procedure.

■ Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices.

FCC Compliance Statement for Class A Devices

The product(s) described in this user’s guide has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user’s guide, may cause harmful interference to radio communications. Operation of this equipment in a residential

area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

Changes or modifications not expressly approved by Quanmax could void the user's authority to operate the equipment.

NOTE



The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interference or to be noncompliant with the appropriate standards for its intended use.

■ Warranty Policy

Limited Warranty

Quanmax Inc.'s detailed Limited Warranty policy can be found under Support at www.quanmax.com. Please consult your distributor for warranty verification.

The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than Quanmax or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of Quanmax or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the user's guide.

No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever.

Quanmax reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.

Return Procedure

For any Limited Warranty return, please contact Support at www.quanmax.com and login to obtain a Return Material Authorization (RMA) Number. If you do not have an account, send an email to support@quanmax.com to apply for one.

All product(s) returned to Quanmax for service or credit must be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items must be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty must include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing the

date of purchase.

To reduce risk of damage, returns of product must be in a Quanmax shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from Quanmax Customer Service at a nominal cost. Quanmax owns all parts removed from repaired products. Quanmax uses new and reconditioned parts made by various manufacturers in performing warranty repairs and building replacement products. If Quanmax repairs or replaces a product, its warranty term is not extended.

Shipments not in compliance with this Limited Warranty Return Policy will not be accepted by Quanmax.

Limitation of Liability

In no event shall Quanmax be liable for any defect in hardware, software, loss, or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. Quanmax's liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by Quanmax or its authorized agent.

■ Maintaining Your Computer

Environmental Factors

■ Temperature

The ambient temperature within an enclosure may be greater than room ambient temperature. Installation in an enclosure should be such that the amount of air flow required for safe operation is not compromised.

Consideration should be given to the maximum rated ambient temperature.

Overheating can cause a variety of problems, including premature aging and failure of chips or mechanical failure of devices.

If the system has been exposed to abnormally cold temperatures, allow a two-hour warm-up period to bring it up to normal operating temperature before turning it on. Failure to do so may cause damage to internal components, particularly the hard disk drive.

■ Humidity

High-humidity can cause moisture to enter and accumulate in the system. This moisture can cause corrosion of internal components and degrade such

properties as electrical resistance and thermal conductivity. Extreme moisture buildup inside the system can result in electrical shorts, which can cause serious damage to the system.

Buildings in which climate is controlled usually maintain an acceptable level of humidity for system equipment. However, if a system is located in an unusually humid location, a dehumidifier can be used to maintain the humidity within an acceptable range. Refer to the “Specifications” section of this user’s guide for the operating and storage humidity specifications.

■ **Altitude**

Operating a system at a high altitude (low pressure) reduces the efficiency of the cooling fans to cool the system. This can cause electrical problems related to arcing and corona effects. This condition can also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or perform at reduced efficiency.

Power Protection

The greatest threats to a system’s supply of power are power loss, power spikes, and power surges caused by electrical storms, which interrupt system operation and/or damage system components. To protect your system, always properly ground power cables and one of the following devices.

■ **Surge Protector**

Surge protectors are available in a variety of types and usually provide a level of protection proportional with the cost of the device. Surge protectors prevent voltage spikes from entering a system through the AC power cord. Surge protectors, however, do not offer protection against brownouts, which occur when the voltage drops more than 20 percent below the normal AC line voltage level.

■ **Line Conditioner**

Line conditioners go beyond the over voltage protection of surge protectors. Line conditioners keep a system’s AC power source voltage at a fairly constant level and, therefore, can handle brownouts. Because of this added protection, line conditioners cost more than surge protectors. However, line conditioners cannot protect against a complete loss of power.

■ **Uninterruptible Power Supply**

Uninterruptible power supply (UPS) systems offer the most complete protection against variations on power because they use battery power to keep the server running when AC power is lost. The battery is charged by the AC power while it is available, so when AC power is lost, the battery can provide power to the system for a limited amount of time, depending on the UPS system.

UPS systems range in price from a few hundred dollars to several thousand dollars, with the more expensive units allowing you to run larger systems for a longer period of time when AC power is lost. UPS systems that provide only 5 minutes of battery power let you conduct an orderly shutdown of the system, but are not intended to provide continued operation. Surge protectors should be used with all UPS systems, and the UPS system should be Underwriters Laboratories (UL) safety approved.

Chapter 1

Introduction

■ Overview

The KEEX-1660 is an industrial embedded single board computer (SBC) that equips the Intel® Atom™ Processor D2550 (1M Cache, 1.86GHz) with the high integration of the Intel® NM10 Express chipset. Featured are 1x DDR3 SO-DIMM socket, 2x 24-bit LVDS, 1x HDMI, 1x VGA, 2x Gigabit Ethernet, 2x SATA, 2x mini PCIe slots, 6x USB 2.0, 2x COM ports and DIO supported

Checklist (* : Optional)

- Driver/ Manual CD
- Quick Installation Guide
- KEEX-1660 main board
- 1xSATA Cable*
- 1x SATA Power Cable*
- 1x DC Jack Cable*

Features

- Intel® Atom™ Processor D2550 (1M Cache, 1.86GHz)
- Intel® NM10 Express chipset
- Support DDR3 SO-DIMM
- Intel® Graphics Media Accelerator 3650
- 6x USB 2.0, 2x COM, 2x GbE LAN, 2x SATA
- DIO supported
- 1xVGA, 1xHDMI, 1x Single Channel LVDS, 1x Dual Channel LVDS Supported
- 2x Mini-PCIe Sockets support USB 2.0

■ Product Specifications

Model Name	▪ KEEX-1660
Form Factor	▪ ECX, 146x105mm
Processor	▪ Intel® Atom™ Processor D2550 (1M Cache, 1.86GHz)
Memory	▪ 1x DDR3 SO-DIMM socket
Chipset	▪ Intel® NM10 Express Chipset
Graphics	<ul style="list-style-type: none"> ▪ Intel Cedarview-M integrated 2D/3D Graphics Engine <ul style="list-style-type: none"> ● 1x VGA ● 1x HDMI ● 1x single channel 18/24-bit LVDS1 with backlight control ● 1x dual channel 18/24-bit LVDS2 with backlight control
Ethernet	<ul style="list-style-type: none"> ▪ 2x Gb/s Ethernet ports supported <ul style="list-style-type: none"> ● 2x Realtek RTL8111E Gigabit Ethernet controllers <ul style="list-style-type: none"> ◆ 2x RJ-45 with Gb/s transformer connectors ● PXE/RPL/WOL supported
Audio	<ul style="list-style-type: none"> ▪ Realtek ALC662-VC HD codec onboard <ul style="list-style-type: none"> ● 2x6 pitch 2.54mm pin header for Line-out, Line-in and MIC-in ● Jack detection supported ▪ 2W audio amplifier onboard <ul style="list-style-type: none"> ● 2x Speaker out ▪ 1x S/PDIF
Peripheral Support	<ul style="list-style-type: none"> ▪ Storage supported <ul style="list-style-type: none"> ● 2x SATA connectors ● 1x SATA device power output ● Reserved 1x mSATA socket ▪ 6x USB <ul style="list-style-type: none"> ● 4x USB 2.0 ports for external use ● 2x USB2.0 ports for internal use ▪ FAN supported <ul style="list-style-type: none"> ● 1x 5VDC FAN supported ● Smart FAN supported ▪ Digital I/O supported <ul style="list-style-type: none"> ● 1x digital I/O supported ● Input / Output programmable ▪ Front panel supported <ul style="list-style-type: none"> ● 1x Reset button, HDD LED and External Speaker supported ● 1x Power button, Power LED, Keyboard lock and SM bus supported ▪ 1x buzzer onboard
Expansion Slot	▪ 2x Mini-PCIe slots support USB 2.0
BIOS	<ul style="list-style-type: none"> ▪ AMI uEFI BIOS ▪ 1x 16Mb SPI flash ROM
Hardware Monitor	<ul style="list-style-type: none"> ▪ Voltages monitoring ▪ Temperature monitoring.
Watchdog	▪ Super I/O integrated WDT, max. 65535 seconds/minutes selectable
Real Time Clock	▪ NM10 integrated RTC

Battery	▪ 1x Battery connection (Lithium Battery, 3V)
Power	▪ 1x +12VDC power input ▪ AT / ATX power mode supported
Operation Temp.	▪ 0°C – 60°C
Certifications	▪ CE, FCC Class A

Table 1 KEEX-1660 Specification

■ System Block Diagram

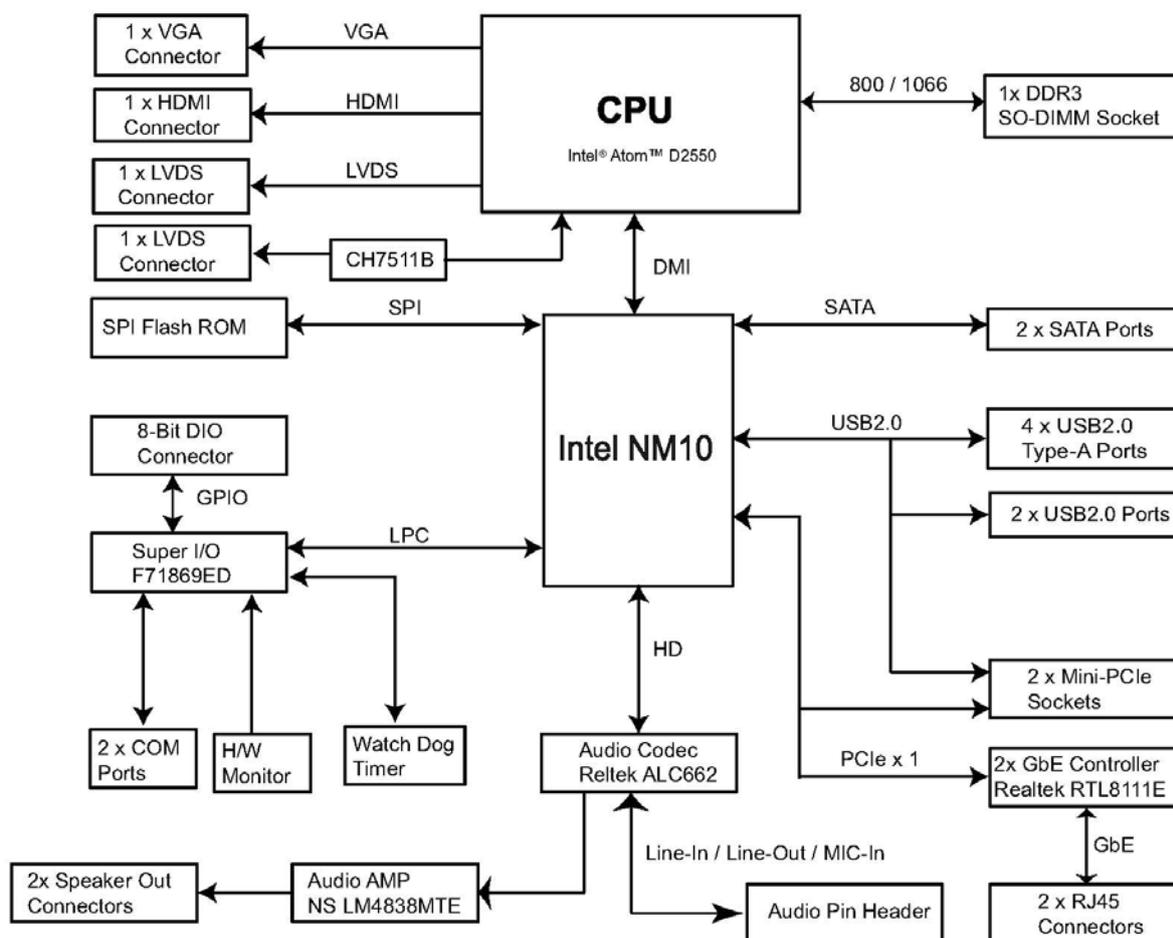
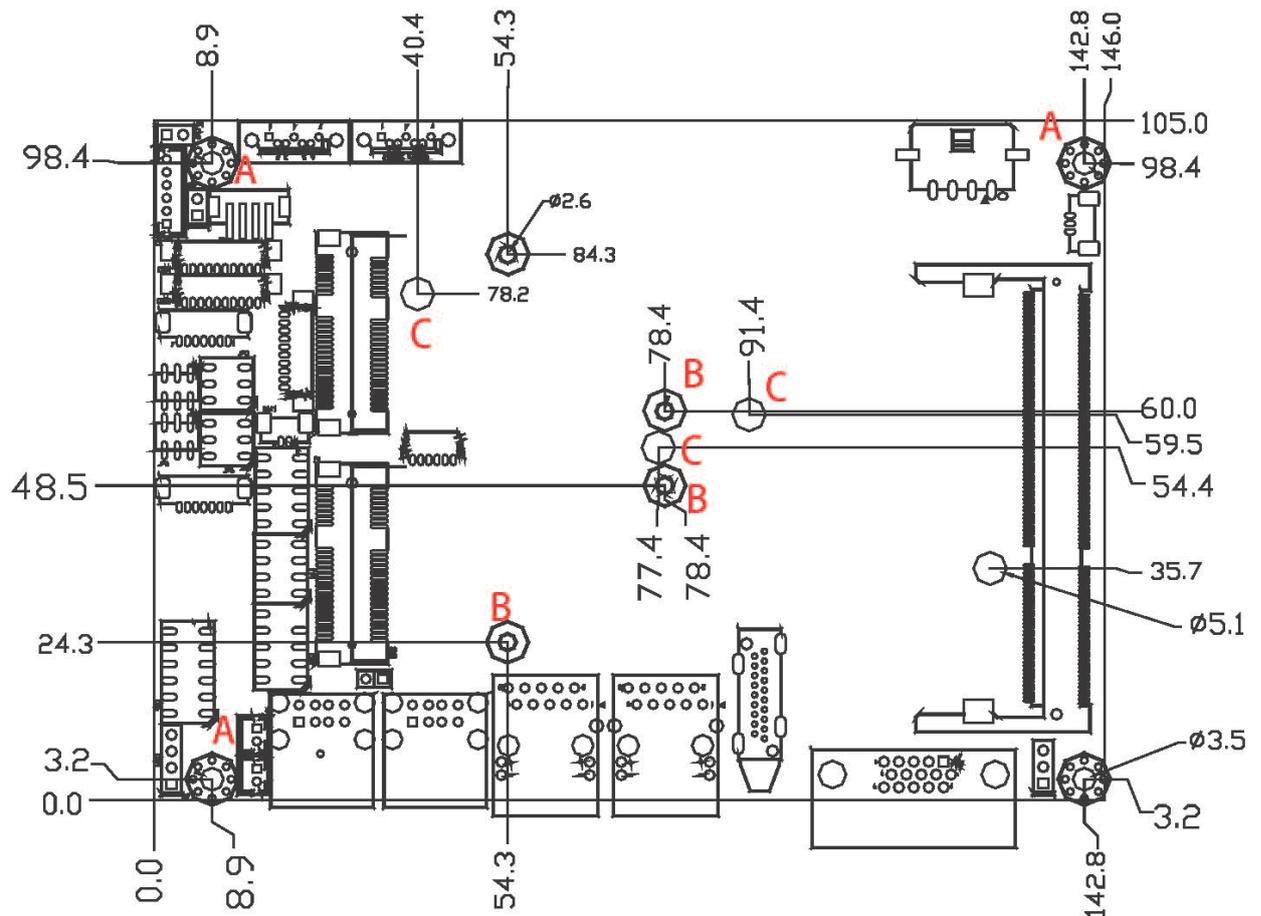
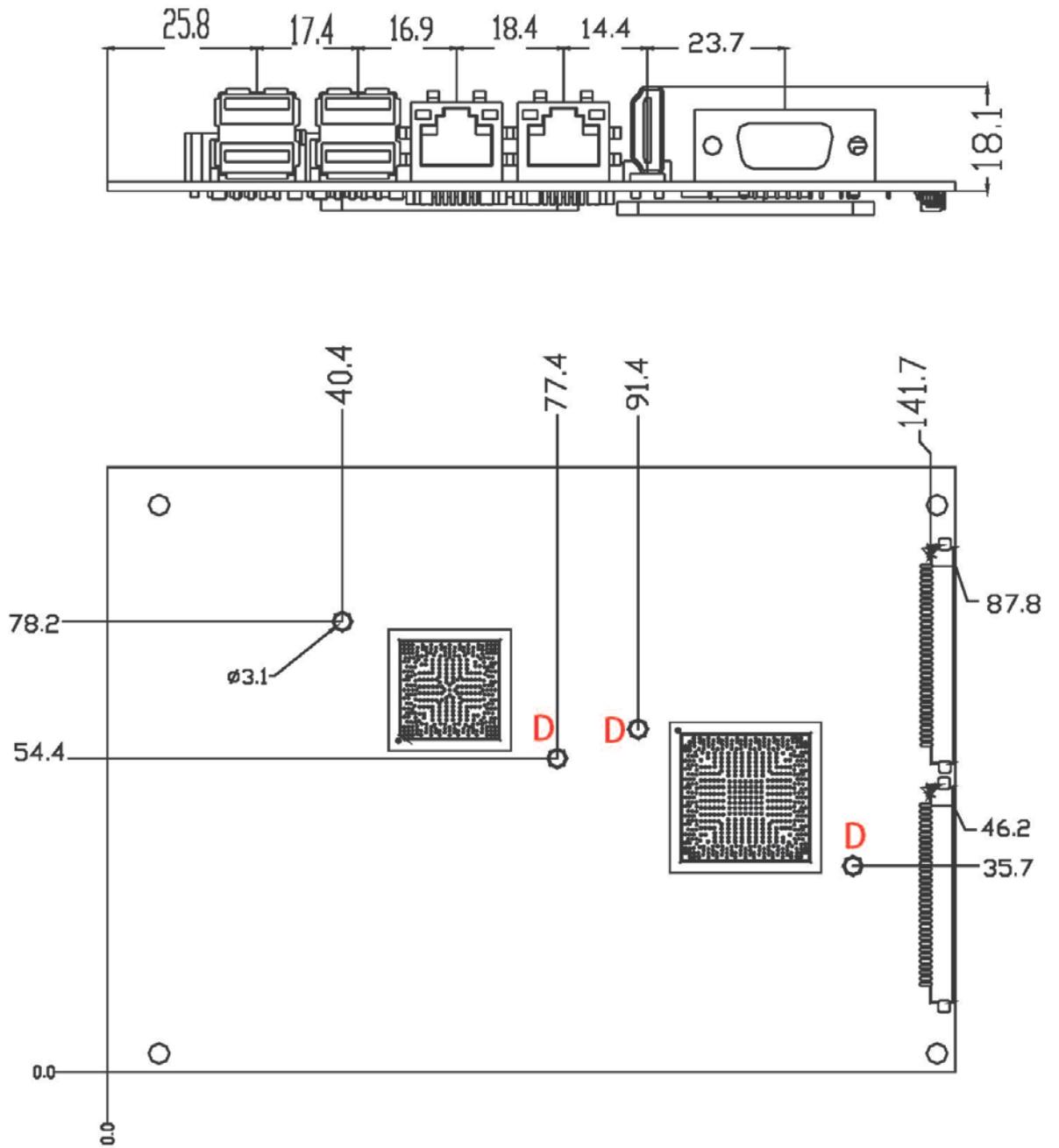


Figure 1 Block Diagram

■ Mechanical Dimensions





*A- ϕ : 3.5mm *B- ϕ : 2.6mm *C- ϕ : 5.1mm *D- ϕ : 3.1mm

Figure 2 Mechanical Dimensions

Chapter 2

Hardware Settings

■ Overview

This chapter provides the definitions and locations of jumpers, headers, and connectors.

Jumpers

The product has several jumpers which must be properly configured to ensure correct operation.

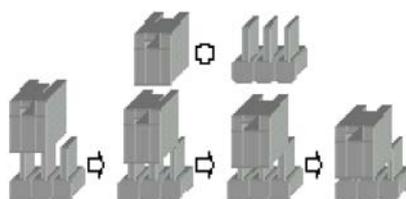


Figure 3 Jumper Connector

For a three-pin jumper (see *Figure 3*), the jumper setting is designated “1-2” when the jumper connects pins 1 and 2. The jumper setting is designated “2-3” when pins 2 and 3 are connected and so on. You will see that one of the lines surrounding a jumper pin is thick, which indicates pin No.1.

To move a jumper from one position to another, use needle-nose pliers or tweezers to pull the pin cap off the pins and move it to the desired position.

■ Jumper Settings and Pin Definitions

For jumper and connector locations, please refer to the diagrams below.

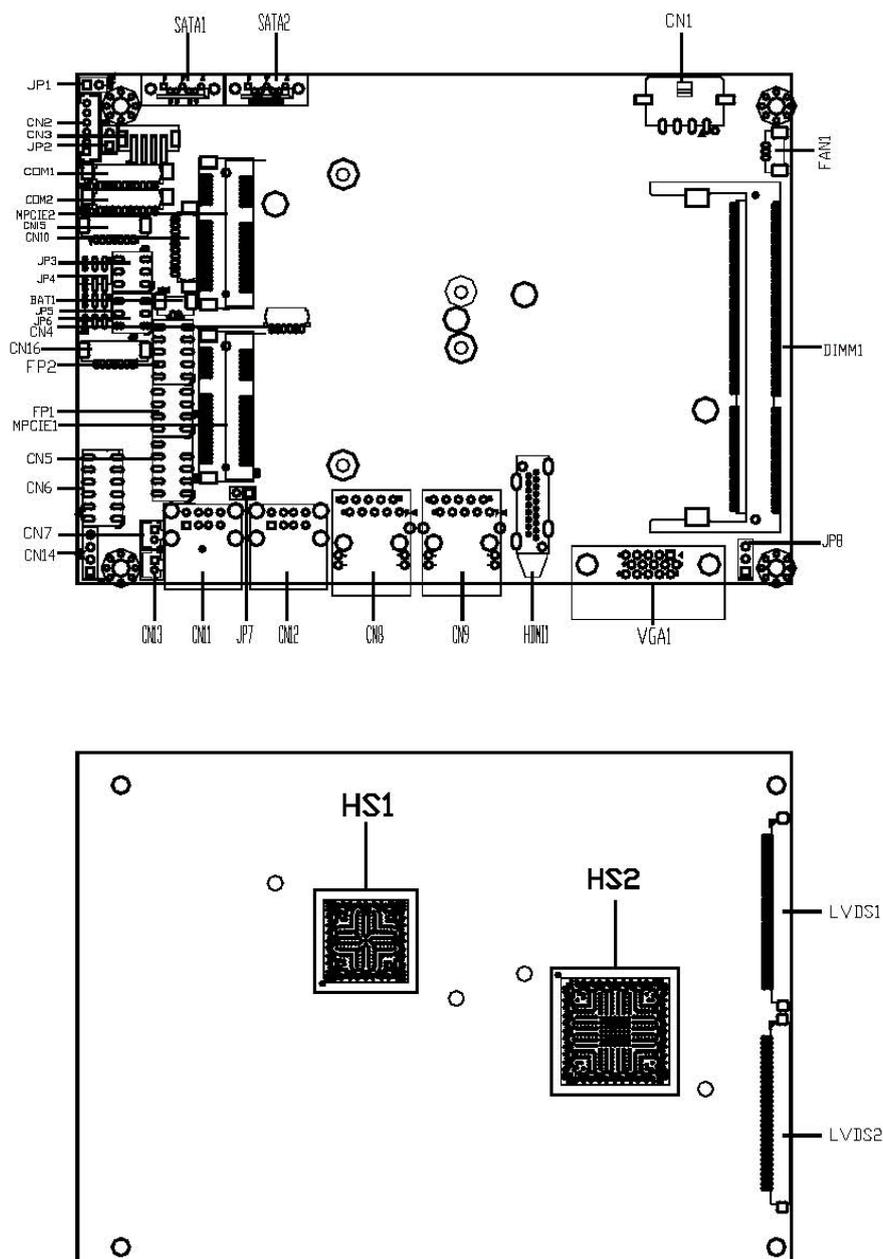


Figure 4 Jumper and Connector Locations

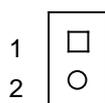
Jumper Settings

To ensure correct system configuration, the following section describes how to set the jumpers to enable/disable or change functions. For jumper descriptions, please refer to the table below.

Table 2 Jumper List

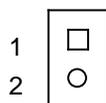
Label	Function
JP1	RTC Reset Selection
JP2	USB Power Selection
JP3	Panel & Backlight Power Selection for LVDS1
JP4	Backlight Enable Selection for LVDS1
JP5	Backlight Enable Selection for LVDS2
JP6	Panel & Backlight Power Selection for LVDS2
JP7	MPCIe Activity LED Indication
JP8	AT / ATX Power Mode Selection

Table 3 JP1 RTC Reset Selection



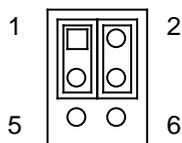
Jumper	Status
1-2 Open	Normal Operation.
1-2 Short	Clear CMOS
Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]	

Table 4 JP2 USB Power Selection



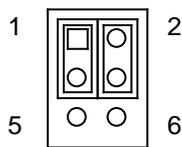
Jumper	Status
1-2 Open	USB power will be cut off in S4 & S5 state.
1-2 Short	USB power is always supply.
Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]	

Table 5 JP3 Panel & Backlight Power Selection for LVDS1



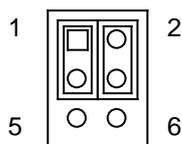
Jumper	Setting	Status
1	1-3	Backlight Power = +12V
	3-5	Backlight Power = +5V
2	2-4	Panel Power = +3.3V
	4-6	Panel Power = +5V
Pitch:2.54mm [YIMTEX 3362*03SAGR]		

Table 6 JP4 Backlight Enable Selection for LVDS1



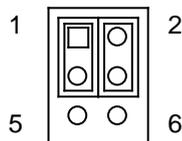
Jumper	Setting	Status
1	1-3	Backlight Enable Level = +3.3V
	3-5	Backlight Enable Level = +5V
2	2-4	Backlight Enable High Active
	4-6	Backlight Enable Low Active
Pitch:2.0mm[PINREX 222-97-03GBB1]		

Table 7 JP5 Backlight Enable Selection for LVDS2



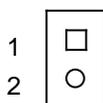
Jumper	Setting	Status
1	1-3	Backlight Enable Voltage = +3.3V
	3-5	Backlight Enable Voltage = +5V
2	2-4	Backlight Enable High Active
	4-6	Backlight Enable Low Active
Pitch:2.0mm[PINREX 222-97-03GBB1]		

Table 8 JP6 Panel & Backlight Power Selection for LVDS2



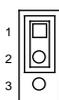
Jumper	Setting	Status
1	1-3	Backlight Power = +12V
	3-5	Backlight Power = +5V
2	2-4	Panel Power = +3.3V
	4-6	Panel Power = +5V
Pitch:2.54mm [YIMTEX 3362*03SAGR]		

Table 9 JP7 MPCle Activity LED Indication



Pin	Description
1	LED+
2	LED-
Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]	

Table 10 JP8 AT / ATX Power Mode Selection

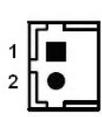


Jumper	Status
1-2 Short	ATX Mode
2-3 Short	AT Mode
Pitch:2.54mm [YIMTEX 3321*02SAGR(6T)]	

Internal Connector Pin Assignment

Label	Function
BAT1	CR2032 Battery Power Input Wafer
BZ1	Onboard Buzzer
COM1	RS-232/422/485 Port 1 Wafer
COM2	RS-232 Port 2 Wafer
CN1	DC12V Power Input Wafer
CN2	PS/2 Keyboard / Mouse Wafer
CN3	HDD Power Output Wafer
CN4	SIM Interface Wafer for MPCIE1
CN5	USB2.0 Port 4, 5 Pin Header
CN6	Audio Input / Output Pin Header
CN7	Left Channel 2W Audio AMP Output Wafer
CN10	Digital Input / Output Wafer
CN13	Right Channel 2W Audio AMP Output Wafer
CN14	S/PDIF Output Pin Header
CN15	Backlight Power Output Wafer for LVDS1
CN16	Backlight Power Output Wafer for LVDS2
DIMM1	DDR3 Memory SO-DIMM Socket
FAN1	DC5V FAN Wafer
FP1	Front Panel 1 Pin Header
FP2	Front Panel 2 Pin Header
LVDS1	18/24-bit, Single Channel LVDS Panel Connector
LVDS2	Secondary 18/24-bit, 2-channel LVDS Panel Connector
MPCIE1	Mini-PCI Express v1.2 Socket 1
MPCIE2	Mini-PCI Express v1.2 Socket 2
SATA1	Serial ATA Port 0 Connector
SATA2	Serial ATA Port 1 Connector

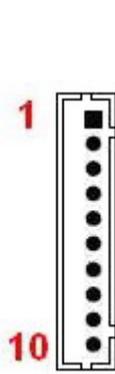
Table 11 BAT1 CR2032 Battery Power Input Wafer



Pin	Signal Name
1	Battery+
2	Battery-

Pitch:1.25mm [Pinrex 712-73-02TWR0]

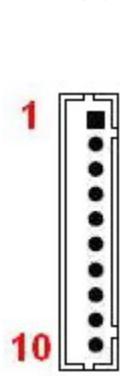
Table 12 COM1 RS-232/422/485 Port 1 Wafer



Pin	RS-232	RS-422	Half Duplex RS-485	Full Duplex RS-485
1	DCD	TX-	DATA-	TX-
2	DSR	N/A	N/A	N/A
3	RXD	RX+	N/A	RX+
4	RTS	N/A	N/A	N/A
5	TXD	TX+	DATA+	TX+
6	CTS	N/A	N/A	N/A
7	DTR	RX-	N/A	RX-
8	RI	N/A	N/A	N/A
9	GND	GND	GND	GND
10	+5V	+5V	+5V	+5V

Pitch:1.25mm [Pinrex 712-73-10TWB0]

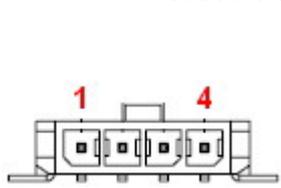
Table 13 COM2 RS-232 Port 2 Wafer



Pin	Signal Name
1	DCD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	GND
10	+5V

Pitch:1.25mm [Pinrex 712-73-10TWB0]

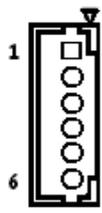
Table 14 CN1 DC12V Power Input Wafer



Pin	Signal
1	+12Vin
2	GND
3	GND
4	+12Vin

Pitch: 3.0mm WAFER [Pinrex 733-97-04TBR1]

Table 15 CN2 PS/2 Keyboard / Mouse Wafer



Pin	Signal Name
1	MSCLK
2	VCC
3	MSDAT*
4	KBDAT
5	GND
6	KBCLK
Pitch:2.0mm [YIMTEX 503PW1*06ST-1R]	

Table 16 CN3 HDD Power Output Wafer



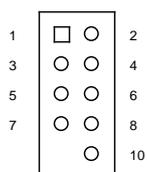
Pin	Signal
1	+12V
2	GND
3	GND
4	+5V
Pitch: 2.0mm WAFER [Pinrex 721-93-04TWR9]	

Table 17 CN4 SIM Interface Wafer for MPCle1



Pin	Signal Name
1	UIM_PWR
2	UIM_DATA
3	UIM_RESET
4	UIM_VPP
5	UIM_CLK
6	GND
Pitch:1.25mm [Pinrex 712-73-06TWB0]	

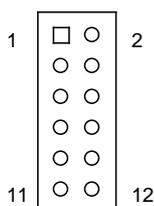
Table 18 CN5 USB2.0 Port 4, 5 Pin Header



Pin	Signal Name	Pin	Signal Name
1	+USBVCC	2	+USBVCC
3	USB_A-	4	USB_B-
5	USB_A+	6	USB_B+
7	GND	8	GND
9	KEY	10	GND

Pitch:2.54mm [YIMTEX 3362*05SANGR-09]

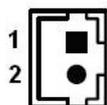
Table 19 CN6 Audio Input / Output Pin Header



Pin	Signal Name	Pin	Signal Name
1	MIC-In_L	2	MIC-In_R
3	MIC-In_JD#	4	GND
5	Line-In_L	6	Line-In_R
7	Line-In_JD#	8	GND
9	Line-Out_L	10	Line-Out_R
11	Line-Out_JD#	12	GND

Pitch:2.54mm [Pinrex 212-92-06GBE1]

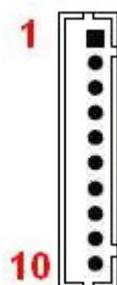
Table 20 CN7 Left Channel 2W Audio AMP Output Wafer



Pin	Signal Name
1	Speaker+
2	Speaker-

Pitch:2.0mm [YIMTEX 503PW1*02STR]

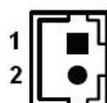
Table 21 CN10 Digital Input / Output Wafer



Pin	Signal Name
1	+5V
2	DIO_0
3	DIO_1
4	DIO_2
5	DIO_3
6	DIO_4
7	DIO_5
8	DIO_6
9	DIO_7
10	GND

Pitch:1.25mm [Pinrex 712-73-10TWB0]

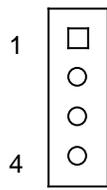
Table 22 CN13 Right Channel 2W Audio AMP Output Wafer



Pin	Signal Name
1	Speaker+
2	Speaker-

Pitch:2.0mm [YIMTEX 503PW1*02STR]

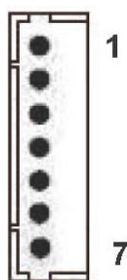
Table 23 CN14 S/PDIF Output Pin Header



Pin	Signal
1	BIOS_REC#*
2	GND
3	S/PDIF Output
4	GND

Pitch: 3.0mm WAFER [Pinrex 733-97-04TBR1]
* : Quanmax validation only.

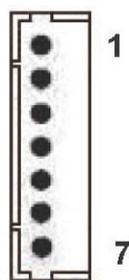
Table 24 CN15 Backlight Power Output Wafer for LVDS1



Pin	Signal Name
1	BL_ADJ_PWM *
2	BL_ADJ_VOL *
3	GND
4	+5V / +12V **
5	+5V / +12V **
6	GND
7	BL_EN***

Pitch: 1.25mm [YIMTEX 501MW1X07MTR-1R]
* : BL_ADJ can be setting in BIOS setup.
** : Backlight Power can be selected by JP3.
*** : BL_EN can be selected by JP4.

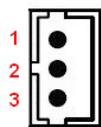
Table 25 CN16 Backlight Power Output Wafer for LVDS2



Pin	Signal Name
1	BL_ADJ_PWM *
2	BL_ADJ_VOL *
3	GND
4	+5V / +12V **
5	+5V / +12V **
6	GND
7	BL_EN***

Pitch: 1.25mm [YIMTEX 501MW1X07MTR-1R]
* : BL_ADJ can be setting in BIOS setup.
** : Backlight Power can be selected by JP6.
*** : BL_EN can be selected by JP5.

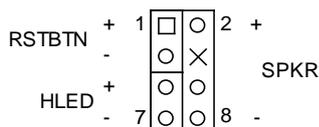
Table 26 FAN1 DC5V FAN Wafer



Pin	Signal
1	SENSE
2	+5V
3	GND

Pitch: 1.25mm WAFER [Pinrex 712-73-03TWE0]

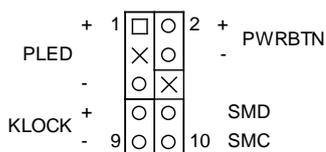
Table 27 FP1 Front Panel 1 Pin Header



Pin	Signal	Pin	Signal
1	Reset Button +	2	Speaker +
3	Reset Button -	4	NC
5	HDD LED +	6	Internal Speaker-
7	HDD LED -	8	Speaker -

Pitch:2.54mm [YIMTEX 3362*04SANGR]
 Note : Internal Buzzer is enabled when Pin6-8 is shorted.

Table 28 FP2 Front Panel 2 Pin Header



Pin	Signal	Pin	Signal
1	Power LED +	2	Power Button +
3	NC	4	Power Button -
5	Power LED -	6	NC
7	Keyboard Lock	8	SMBus Data
9	GND	10	SMBus Clock

Pitch:2.54mm [YIMTEX 3362*05SANGR]

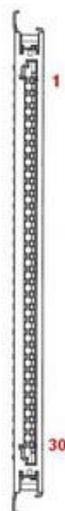
Table 29 LVDS1 18/24-bit, Single Channel LVDS Panel Connector



Pin	Signal Name	Pin	Signal Name
1	LVDS_TX0-	16	NC
2	LVDS_TX0+	17	GND
3	LVDS_TX1-	18	NC
4	LVDS_TX1+	19	NC
5	LVDS_TX2-	20	NC
6	LVDS_TX2+	21	NC
7	GND	22	NC
8	LVDS_CLK-	23	NC
9	LVDS_CLK+	24	GND
10	LVDS_TX3- / NC*	25	DDC_DATA
11	LVDS_TX3+ / NC*	26	VDDEN
12	NC	27	DDC_CLK
13	NC	28	+3.3V / +5V **
14	GND	29	+3.3V / +5V **
15	NC	30	+3.3V / +5V **

Pitch:1.0mm [JAE FI-X30SSL-HF]
 * : 24-bit LVDS, LVDS_TX3 for Atom D2700 only.
 ** : Panel Power can be selected by JP3.

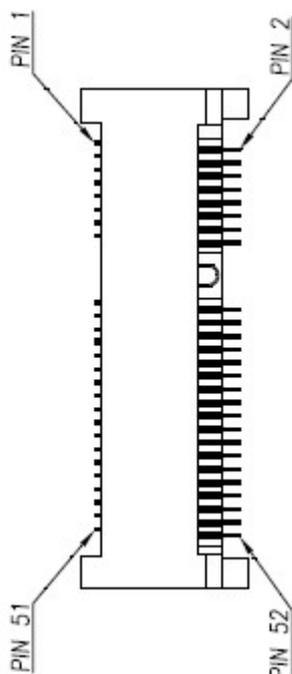
Table 30 LVDS2 Secondary 18/24-bit, 2-Channel LVDS Panel Connector



Pin	Signal Name	Pin	Signal Name
1	LVDS_A0-	16	LVDS_B1+
2	LVDS_A0+	17	GND
3	LVDS_A1-	18	LVDS_B2-
4	LVDS_A1+	19	LVDS_B2+
5	LVDS_A2-	20	LVDSBCLK-
6	LVDS_A2+	21	LVDS_BCLK+
7	GND	22	LVDS_B3-/NC
8	LVDS_ACLK-	23	LVDS_B3+/NC
9	LVDS_ACLK+	24	GND
10	LVDS_A3-/NC	25	DDC_DATA
11	LVDS_A3+/NC	26	VDDEN
12	LVDS_B0-	27	DDC_CLK
13	LVDS_B0+	28	+3.3V / +5V *
14	GND	29	+3.3V / +5V *
15	LVDS_B1-	30	+3.3V / +5V *

Pitch:1.0mm [JAE FI-X30SSL-HF]
 * : Panel Power can be selected by JP6.

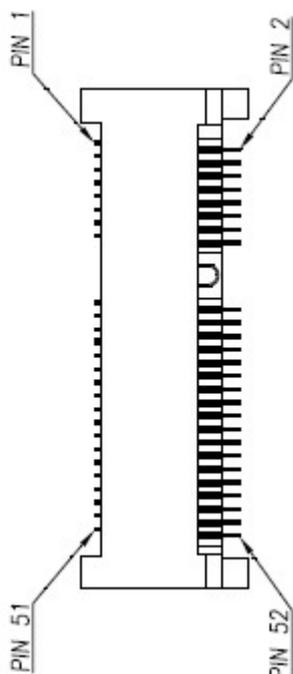
Table 31 MPCle1 Mini-PCI Express v1.2 Socket 1



Signal	Pin	Pin	Signal
WAKE#	1	2	+3.3VSB
Reserved	3	4	Ground
Reserved	5	6	+1.5V
CLKREQ#	7	8	UIM_PWR*
Ground	9	10	UIM_DATA*
REFCLK-	11	12	UIM_CLK*
REFCLK+	13	14	UIM_RESET*
Ground	15	16	UIM_VPP*
Reserved	17	18	Ground
Reserved	19	20	W_Disable#
Ground	21	22	PERST#
PERn0	23	24	+3.3VSB
PERp0	25	26	Ground
Ground	27	28	+1.5V
Ground	29	30	SMB_CLK
PETn0	31	32	SMB_DATA
PETp0	33	34	Ground
Ground	35	36	USB_D-
Ground	37	38	USB_D+
+3.3VSB	39	40	Ground
+3.3VSB	41	42	LED_WWAN#
Ground	43	44	LED_WLAN#
Reserved	45	46	LED_WPAN#
Reserved	47	48	+1.5V
Reserved	49	50	Ground
Reserved	51	52	+3.3VSB

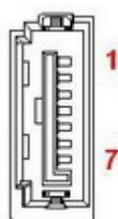
Height:9.9mm [FOXCONN AS0B226-S99Q-7H]
 * : These pins are connected to CN4 directly.

Table 32 MPCle2 Mini-PCI Express v1.2 Socket 2



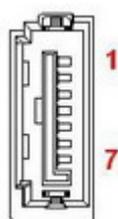
Signal	Pin	Pin	Signal
WAKE#	1	2	+3.3VSB
Reserved	3	4	Ground
Reserved	5	6	+1.5V
CLKREQ#	7	8	Reserved
Ground	9	10	Reserved
REFCLK-	11	12	Reserved
REFCLK+	13	14	Reserved
Ground	15	16	Reserved
Reserved	17	18	Ground
Reserved	19	20	W_Disable#
Ground	21	22	PERST#
PERn0	23	24	+3.3VSB
PERp0	25	26	Ground
Ground	27	28	+1.5V
Ground	29	30	SMB_CLK
PETn0	31	32	SMB_DATA
PETp0	33	34	Ground
Ground	35	36	USB_D-
Ground	37	38	USB_D+
+3.3VSB	39	40	Ground
+3.3VSB	41	42	LED_WWAN#
Ground	43	44	LED_WLAN#
Reserved	45	46	LED_WPAN#
Reserved	47	48	+1.5V
Reserved	49	50	Ground
Reserved	51	52	+3.3VSB
Height:9.9mm [FOXCONN AS0B226-S99Q-7H]			

Table 33 SATA1 Serial ATA Port 0 Connector



Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND
[FOXCONN LD1807V-S52U]	

Table 34 SATA2 Serial ATA Port 1 Connector



Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND
[FOXCONN LD1807V-S52U]	

Rear Panel Pin Assignments

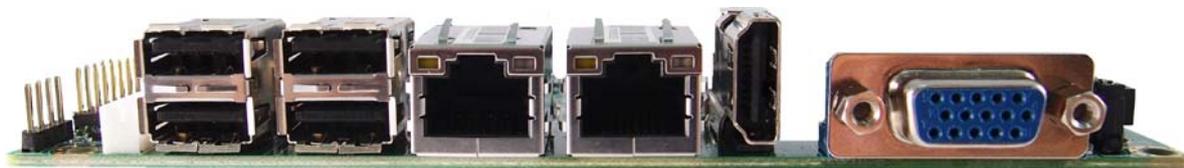
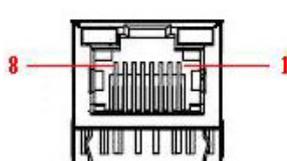


Figure 5 Rear Panel IO

Table 35 Rear Panel Connector List

Label	Function
CN8	GbE LAN1 RJ-45 Connector
CN9	GbE LAN2 RJ-45 Connector
CN11	USB2.0 Port 0,1 Type-A Connector
CN12	USB2.0 Port 2,3 Type-A Connector
VGA1	VGA Connector
HDMI1	HDMI Connector

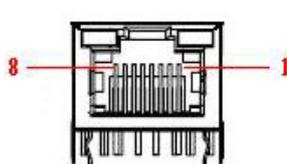
Table 36 CN8 GbE LAN1 RJ-45 Connector



Pin	Signal Name	Pin	Signal Name
1	TX1+	5	TX3-
2	TX1-	6	TX2-
3	TX2+	7	TX4+
4	TX3+	8	TX4-

[UDE RT7-174AAM1A(XA)]

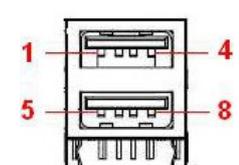
Table 37 CN9 GbE LAN2 RJ-45 Connector



Pin	Signal Name	Pin	Signal Name
1	TX1+	5	TX3-
2	TX1-	6	TX2-
3	TX2+	7	TX4+
4	TX3+	8	TX4-

[UDE RT7-174AAM1A(XA)]

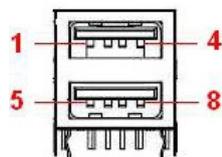
Table 38 CN11 USB2.0 Port 0,1 Type-A Connector



Pin	Signal Name	Pin	Signal Name
1	+USBVCC	5	+USBVCC
2	USB_A-	6	USB_B-
3	USB_A+	7	USB_B+
4	GND	8	GND

[FOXCONN UB1112C-8FDE-4F]

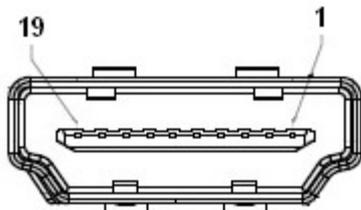
Table 39 CN12 USB2.0 Port 2,3 Type-A Connector



Pin	Signal Name	Pin	Signal Name
1	+USBVCC	5	+USBVCC
2	USB_A-	6	USB_B-
3	USB_A+	7	USB_B+
4	GND	8	GND

[FOXCONN UB1112C-8FDE-4F]

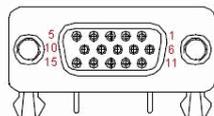
Table 40 HDMI1 HDMI Connector



Pin	Signal
1	TMDS Data2+
2	Ground
3	TMDS Data2-
4	TMDS Data1+
5	Ground
6	TMDS Data1-
7	TMDS Data0+
8	Ground
9	TMDS Data0-
10	TMDS Clock+
11	Ground
12	TMDS Clock-
13	Reserved
14	Reserved
15	DDC_CLK
16	DDC_DATA
17	Ground
18	+5 V Power
19	Hot Plug Detect

[FOXCONN QJ3119C-WFB1-4F]

Table 41 VGA1 DB-15 VGA Connector



Signal Name	Pin	Pin	Signal Name
Red	1	2	Green
Blue	3	4	NC
GND	5	6	GND
GND	7	8	GND
VCC	9	10	GND
NC	11	12	DDC data
HSYNC	13	14	VSYNC
DDC clock	15		

D-SUB 15P DIP (F) 90D H/D CONNECTOR Blue with hexagonal screws [Kingsun 3125-000-15SB]

Chapter 3

System Installation

■ Memory Module Installation

Carefully follow the steps below in order to install the DIMMs:

1. To avoid generating static electricity and damaging the SO-DIMM, ground yourself by touching a grounded metal surface or use a ground strap before you touch the SO-DIMM.
2. Do not touch the connectors of the SO-DIMM. Dirt or other residue may cause a malfunction.
3. Hold the SO-DIMM with its notch aligned with the memory socket of the board and insert it at a 30-degree angle into the socket.

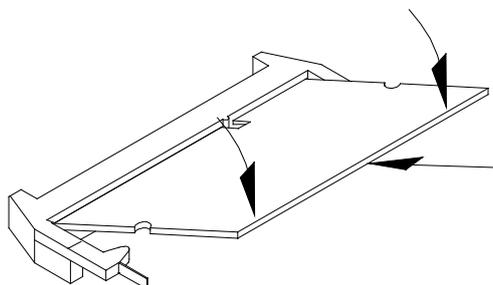


Figure 6 Align the SO-DIMM Memory Module with the onboard socket

4. Fully insert the module into the socket until a “click” is heard.
5. Press down on the SO-DIMM so that the tabs of the socket lock on both sides of the module

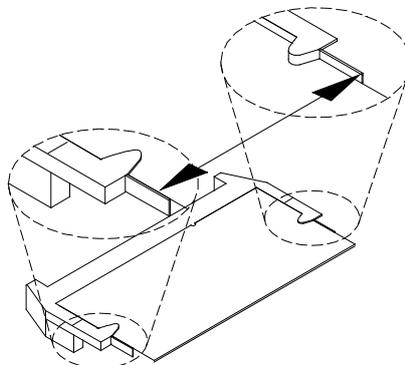


Figure 7 Press down on the SO-DIMM Memory Module to lock it in place

Removing a DIMM:

To remove the SO-DIMM, use your fingers or a small screwdriver to carefully push away the tabs that secure either side of the SO-DIMM. Lift it out of the socket.

Make sure you store the SO-DIMM in an anti-static bag. The socket must be populated with memory modules of the same size and manufacturer.

Chapter 4

AMI BIOS Setup

■ Overview

This chapter provides a description of the AMI BIOS. The BIOS setup menus and available selections may vary from those of your product. For specific information on the BIOS for your product, please contact Quanmax.



NOTE: The BIOS menus and selections for your product may vary from those in this chapter. For the BIOS manual specific to your product, please contact Quanmax

AMI's ROM BIOS provides a built-in Setup program, which allows the user to modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will not need to be changed unless there is a configuration change in the system, such as a hard drive replacement or when a device is added.

It is possible for the CMOS battery to fail, which will cause data loss in the CMOS only. If this happens you will need to reconfigure your BIOS settings.

■ Main Menu

The BIOS Setup is accessed by pressing the DEL key after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins. Once you enter the BIOS Setup Utility, the Main Menu will appear on the screen. The Main Menu provides System Overview information and allows you to set the System Time and Date. Use the “<” and “>” cursor keys to navigate between menu screens.

Table 42 BIOS Main Menu

BIOS SETUP UTILITY				
Main	Advanced	Boot	Security	Save & Exit
Product Information				
Product Name		KEEX-1660		
BIOS Version		0.06		
BIOS Build Date		02/21/2013		
CPU Information				
Intel® Atom™ CPU D2550@1.86GHz				
Microcode Revision		10d		
Processor Cores		2		
Memory Information				
Total Size		4096 MB		
Frequency		1067 MHz (DDR3)		
System date		[Wed 04/03/2013]		
System time		[13:23:12]		
→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit				
Version 2.15.1226. Copyright (C) 2012, American Megatrends, Inc.				

■ Advanced Menu

Table 43 Advanced Menu

BIOS SETUP UTILITY		
Main	Advanced	Boot Security Server Mgmt Save & Exit
Onboard LAN1 Controller	[Enabled]	
Onboard LAN1 Boot	[Disabled]	
Onboard LAN2 Controller	[Enabled]	
Onboard LAN2 Boot	[Disabled]	
Audio Controller	[Enabled]	
> Display Configuration		→ ← Select Screen
> Power Management Configuration		↑↓ Select Item
> CPU Advanced Configuration		Enter: Select
> SATA Configuration		+ - Change Opt.
> USB Configuration		F1: General Help
> DIO Configuration		F2: Previous Values
> Super IO Configuration		F3: Optimized Defaults
> H/W Monitor		F4 Save & Exit
		ESC Exit
Version 2.15.1226. Copyright (C) 2012, American Megatrends, Inc.		

Onboard LAN 1 Controller

Options: Disabled, Enabled

Onboard LAN 1 Boot

Options: Disabled, Enabled

Onboard LAN 2 Controller

Options: Disabled, Enabled

Onboard LAN 2 Boot

Options: Disabled, Enabled

Audio Controller

Options: Disabled, Enabled

Table 44 Advanced Menu – Display Configuration

BIOS SETUP UTILITY		
Main	Advanced	Boot Security Server Mgmt Save & Exit
Display Configuration		→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
Fixed Graphics Memory Size	[128 MB]	
IGFX – Boot Type	[VBIOS Default]	
Active LVDS	[No LVDS]	
Version 2.15.1226. Copyright (C) 2012, American Megatrends, Inc.		

Fixed Graphics Memory Size

Options: 128MB, 256MB

IGFX – Boot Type

Options: VBIOS Default, CRT

Active LVDS

Options: No LVDS, LVDS 1, LVDS 2, 2 LVDS

- **Note : 2 LVDS doesn't support DOS Mode.**

Table 45 Advanced Menu –Power Management Configuration

BIOS SETUP UTILITY		
Main	Advanced	Boot Security Server Mgmt Save & Exit
Power Management Configuration		
ACPI Sleep State	[S3 (Suspend to RAM)]	→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
Restore AC Power Loss	[Power On]	
Resume From S3 By PS/2 Keyboard	[Disabled]	
Resume From S3 By PS/2 Mouse	[Disabled]	
Resume By PCIE Device	[Disabled]	
Resume By RTC Alarm	[Disabled]	
EUP Power Saving Mode	[Disabled]	
>Watchdog Timer Configuration		
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ACPI Sleep State

Options: Suspend Disabled, S1 (CPU Stop Clock), S3 (Suspend to RAM)

Restore AC Power Loss

Options: Power Off, Power On, Last State

Resume From S3 By PS/2 Keyboard

Options: Disabled, Enabled

Resume From S3 By PS/2 Mouse

Options: Disabled, Enabled

Resume By PCIE Device

Options: Disabled, Enabled

Resume By RTC Alarm

Options: Disabled, Enabled

EUP Power Saving Mode

Options: Disabled, Enabled

Watchdog Timer Configuration■ **WDT Function** [Disabled]

Options: Disabled, Enabled

Table 46 Advanced Menu –CPU Advanced Configuration

BIOS SETUP UTILITY				
Main	Advanced	Boot	Security	Save & Exit
CPU Advanced Configuration				
	Hyper-Treading	[Enabled]		
	Execute Disable Bit	[Enabled]		
	Limit CPUID Maximum	[Disabled]		
	EIST	[Enabled]		
				→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
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Hyper-Treading

Options: Disabled, Enabled

Execute Disable Bit

Options: Disabled, Enabled

Limit CPUID Maximum

Options: Disabled, Enabled

EIST

Options: Disabled, Enabled

Table 47 Advanced Menu –SATA Configuration

BIOS SETUP UTILITY				
Main	Advanced	Boot	Security	Save & Exit
Configure SATA as		[AHCI]		
SATA Port 1	WDC WD1600BEVS (160.GB)			
SATA Port 2	Not Present			
				→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
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Configure SATA as

Options: IDE, AHCI

Table 48 Advanced Menu –USB Configuration

BIOS SETUP UTILITY				
Main	Advanced	Boot	Security	Save & Exit
USB Configuration				
USB Devices:				
1 Keyboard				
Legacy USB Support		[Enabled]		
EHCI Hand-off		[Disabled]		
				. → ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
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Legacy USB Support

Options: Disabled, Enabled, Auto

EHCI hand-off

Options: Disabled, Enabled

Table 49 Advanced Menu –DIO Configuration

BIOS SETUP UTILITY				
Main	Advanced	Boot	Security	Save & Exit
DIO Configuration				
DIO-0		[Output Low]		
DIO-1		[Output Low]		
DIO-2		[Output Low]		
DIO-3		[Output Low]		
DIO-4		[Output Low]		
DIO-5		[Output Low]		
DIO-6		[Output Low]		
DIO-7		[Output Low]		
DIO-0 Value		0		
DIO-1 Value		0		
DIO-2 Value		0		
DIO-3 Value		0		
DIO-4 Value		0		
DIO-5 Value		0		
DIO-6 Value		0		
DIO-7 Value		0		
				→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
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DIO-0

Options: Output Low, Output High, Input

DIO-1

Options: Output Low, Output High, Input

DIO-2

Options: Output Low, Output High, Input

DIO-3

Options: Output Low, Output High, Input

DIO-4

Options: Output Low, Output High, Input

DIO-5

Options: Output Low, Output High, Input

DIO-6

Options: Output Low, Output High, Input

DIO-7

Options: Output Low, Output High, Input

Table 50 Advanced Menu – Super IO Configuration

BIOS SETUP UTILITY	
Main	Advanced
Super IO Configuration >Serial Port 1 Configuration >Serial Port 2 Configuration	→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
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Table 51 Advanced Menu – Super IO Configuration – Serial Port 1 Configuration

BIOS SETUP UTILITY	
Main	Advanced
Serial Port 1 Configuration Serial Port [Enabled] Device Settings IO=3F8h ; IRQ=4; Change Settings [Auto] Serial Port 1 Type [RS232]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save and Exit ESC: Exit
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Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto,

IO=3F8h; IRQ=4;

IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

Serial Port Type

Options: RS232, RS422, RS485

Table 52 Advanced Menu – Super IO Configuration – Serial Port 2 Configuration

BIOS SETUP UTILITY				
Main	Advanced	Boot	Security	Save & Exit
Serial Port 2 Configuration			[Enabled]	→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit
Serial Port Device Settings			IO=2F8h; IRQ=3;	
Change Settings			[Auto]	
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Serial Port

Options: Disabled, Enabled

Change Settings

Options: Auto,

IO=2F8h; IRQ=3;

IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12

Table 53 Advanced Menu –H/W Monitor

BIOS SETUP UTILITY					
Main	Advanced	Boot	Security	Save & Exit	
PC Health Status					
CPU Warning Temperature		[Disabled]			
>CPU FAN Configuration					
CPU Temperature		: +62 C			
Memory Temperature		: +47 C			
SYS Temperature		: +38 C			
CPU Fan Speed		: N/A			
+3.3V		: +3.328 V		→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit	
+VCORE		: +1.200 V			
+VGFX		: +1.096 V			
+1.05V		: +1.042V			
+1.5V		: +1.505 V			
+5VDUAL		: +5.120 V			
+VIN		: +11.880 V			
+3.3VSB		: +3.360 V			
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CPU Warning Temperature

Options: Disabled, 80 C, 85 C, 90 C, 95 C

CPU FAN Configuration

FAN Setting [Manual Mode]

Options: Manual Mode, Auto Mode

Manual Duty 255

■ Boot Menu

Table 54 Boot Menu

BIOS SETUP UTILITY				
Main	Advanced	Boot	Security	Save & Exit
Boot Configuration Full Screen LOGO Display [Disabled] Setup Prompt Timeout 1 Bootup NumLock State [On] UEFI BOOT [Disabled] Boot Option Priorities Boot Option #1 [SATA PM : WDC WD160...] Hard Drive BBS Priorities			→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit	
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Full Screen LOGO Display

Options: Disabled, Enabled

Bootup Numlock State

Options: On, Off

UEFI Boot

Options: Disabled, Enabled

Boot Option #1

Options: SATA PM: WD1600BEVS-00RST, Disabled

Hard Drive BBS Priorities

■ Boot Option #1: SATA PM: WD1600BEVS-00RST

Options: SATA PM: WD1600BEVS-00RST, Disabled

■ Security Menu

Table 55 Security Menu

BIOS SETUP UTILITY				
Main	Advanced	Boot	Security	Save & Exit
Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights The password length must be in the following range: Minimum Length 3 Maximum length 20 Administrator Password User Password HDD Security Configuration: HDD 0: WDC WD1600BE			→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit	
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■ Save & Exit Menu

Table 56 Save & Exit Menu

BIOS SETUP UTILITY				
Main	Advanced	Boot	Security	Save & Exit
Save Changes and Reset Discard Changes and Reset Save Options Save Changes Discard Changes Restore Defaults			→ ← Select Screen ↑↓ Select Item Enter: Select +- Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4 Save & Exit ESC Exit	
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Save Changes and Exit

Exit system setup after saving the changes. Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select [Yes] to save changes and exit.

Discard Changes and Exit

Exit system setup without saving any changes. Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than system date, system time, and password, the BIOS asks for a confirmation before exiting.

Discard Changes

Discards changes done so far to any of the setup values. This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select [Yes] to discard any changes and load the previously saved values.

Load Optimal Defaults

Load Optimal Default values for all the setup values. This option allows you to load optimal default values for each of the parameters on the Setup menus, which will provide the best performance settings for your system. The F9 key can be used for this operation.

Load Failsafe Defaults

Load Optimal Default values for all the setup values. This option allows you to load failsafe default values for each of the parameters on the Setup menus, which will provide the most stable performance settings. The F8 key can be used for this operation.

Chapter 5

Driver Installation

If your KEEEX-1660 does not come with an operating system pre-installed, you will need to install an operating system and the necessary drivers to operate it. After you have finished assembling your system and connected the appropriate power source, power it up using the power supply and install the desired operating system.

You can download the drivers for the KEEEX-1660 from the Quanmax website at www.quanmax.com and install as instructed there. For other operating systems, please contact Quanmax.

NOTE



When the system reboots without connecting the CRT, there might be no image on screen when you insert the CRT/VGA cable. Please pressing **<Ctrl>+<Alt>+<F1>** simultaneously to show the image on screen.

Appendix A

DIO (Digital I/O) Sample Code

```

//*****
//KEEX-1660 DOS DIO sample program
//Please compile with Turbo C 3.0 to utilized the program
//0:Low 1:High
//DI_1: IOport 0x50C bit2  DO_1: IOport 0x539 bit4
//DI_2: IOport 0x50C bit3  DO_2: IOport 0x539 bit5
//DI_3: IOport 0x50C bit4  DO_3: IOport 0x539 bit6
//DI_4: IOport 0x50C bit5  DO_4: IOport 0x53B bit0
//*****

int main()
{
    int RetVal;

    //Clear DO_1~4
    RetVal=inp(0x539);//IO Port: 0x539
    RetVal=(RetVal&0x8F);//DO_1 is bit 4
                //DO_2 is bit 5
                //DO_3 is bit 6
    outp(0x539,RetVal);

    RetVal=inp(0x53B);//IO Port: 0x53B
    RetVal=(RetVal&0xFE);//DO_4 is bit 0
    outp(0x53B,RetVal);

    system("pause");

    //Setting DO_1~4
    RetVal=inp(0x539);//IO Port: 0x539
    RetVal=(RetVal|0x70);//DO_1 is bit 4

```

```
        //DO_2 is bit 5
        //DO_3 is bit 6
    outp(0x539,RetVal);

    RetVal=inp(0x53B);//IO Port: 0x53B
    RetVal=(RetVal|0x01);//DO_4 is bit 0
    outp(0x53B,RetVal);

    system("pause");

    //Reading DI_1~4
    RetVal=inp(0x50C);//IO Port: 0x50C
    RetVal=(RetVal&0x3C);//DI_1 is bit 2
        //DI_2 is bit 3
        //DI_3 is bit 4
        //DI_4 is bit 5
    printf("DI_ = %d\n",RetVal);
    system("pause");

    return 0;
}
```

Appendix B

WatchDog Timer Sample Code

```
//=====
//KEEX-1660 DOS Watchdog sample program
//Please compile with Turbo C 3.0 to utilized the program
//=====

#include<stdio.h>
int main()
{
    int value;
    //Initialized the WDT program
    outp(0x2E,0x87);
    outp(0x2E,0x87);

    //Setting Logical Device Number to 0x07
    outp(0x2E,0x07);
    outp(0x2F,0x07);

    //0xF5 bit6
    //If watchdog timeout event occurs, this bit will be set to 1.
    //Write a 1 to this bit will clear it to 0.
    outp(0x2F,0xF5);
    value=inp(0x2F);
    outp(0x2F,(value | 0x40));

    //Set Timer unit
    //(0xF5 bit3(0: 1sec, 1: 60 sec) of watchdog timer by setting this bit)
    outp(0x2E,0xF5);
    value=inp(0x2F);
    outp(0x2F,(value & 0xF7));//set unit sec.

    //Set Timer Value(0xF6 Time of watchdog timer)
    outp(0x2E,0xF6);
    outp(0x2F,0x14);//set to 20 sec (0x14)

    //Enable WDT
    outp(0x2E,0xF5);
    value=inp(0x2F);
    outp(0x2F,(value | 0x30));//
```

```
outp(0x2E,0xF0);  
outp(0x2F,0x81);//bit7 WDTRST# output is enabled  
  
return 0;  
}
```